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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 09/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/749,921

Applicant(s)

O'DONNELL ET AL.

Examiner

Binh X Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 8-18 and 24-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-18, 24-28 and 30-32 is/are rejected.
- 7) ☒ Claim(s) 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Interpretations*

1. In claim 8, the applicants wrote, "wherein the component is a chamber liner made entirely of liquid crystalline polymer and/or a component other than a chamber liner" (emphasis added). Since applicants use the logic term "and/or" in the claim, there are two possible ways to interpret this limitation. The first way of interpretation uses the logic term "and". The second way of interpretation uses the logic term "or".

In claims 14 and 24, the logic term "and/or" appears in the claim. As discussed above, there are two possible ways to interpret this limitation.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 8-12, 14-15, 17-18, and 24-28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In claim 8, the limitation "wherein the component is a chamber liner... and/or a component other than a chamber liner" is non-enable at the logic term "and". It is impossible for a single component (i.e. the component) to be both a chamber liner and a

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component other than a chamber liner. However, it is possible for a single component to be either a chamber liner or a component other than a chamber liner.

In claims 14 and 24, the limitation "wherein the component is a plasma chamber wall, a gas distribution plate.... and/or a focus ring" (emphasis added) is non-enable at the logic term "and".

Claims 9-12, 14-15, 17-18, 24-28 are rejected under 35 U.S.C. 112, first paragraph because they directly or indirectly depend on non-enable claim 8.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 8-12, 14-15, 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakagawa et al. (WO 99/63584).

Respect to claim 8, Nakagawa discloses a component of the semiconductor processing equipment comprising a liquid crystalline polymer on the outer surface thereof (page 5 lines 20-30 or page 6 lines 1-12, Fig 1C). Respect to claims 9-10, Nakagawa discloses the liquid crystal polymer was coated on the surface of the aluminum surface substrate (page 7).

Respect to claims 11-12, Nakagawa discloses that the substrate is an alumite-treated aluminum (pages 7 lines 13-15 and/or lines 21-24). It is known in the art that "alumite" is another just term for alumina or aluminum oxide. Further, it is known that the alumite treatment an anodized process of aluminum (See prior arts made of record

in previous office action). Therefore, the examiner interprets that Nakagawa's teaching of "alumite treated aluminum" read on the limitation of claims 11-12.

Respect to claims 14-15, Nakagawa discloses the component is a chamber wall and the liquid crystal polymer comprises a preformed sheet covering the surface of a substrate (abstract). Respect to claim 18, Nakagawa discloses the plasma chamber comprises at least one component (col. 4 line 60 to col. 5 lines 25).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 13, 24, 27, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakagawa in view of Clarke et al. (US 6,120,854).

Respect to claim 13, Nakagawa fails to disclose the liquid crystalline polymer comprises a plasma sprayed coating. However, Nakagawa clearly discloses the liquid crystalline polymer was applied with a spray gun (col. 4 lines 60-63). In a liquid crystalline polymer process, Clarke discloses the liquid crystalline polymers comprise a plasma sprayed coating using a spray gun (col. 3). It would have been obvious to one having ordinary skill in the art, at the time of invention, to use plasma sprayed coating to form liquid crystalline polymer because it would result in a uniform thickness. Respect to claim 24, Nakagawa discloses the component is a chamber liner.

Respect to claims 27 and 31, Nakagawa fail to explicitly discloses the substrate is of stainless steel, a refractory metal or a polymeric material. However, Nakagawa clearly discloses the substrate is aluminum metal. Clarke discloses the substrate can be either metallic or polymeric material (col. 5 lines 1-5). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Nakagawa in view of Clarke by using polymeric material because equivalent and substitution of one for the other would produce an expected result.

9. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakagawa and Clarke as applied to claim 13 above, and further in view of Nagashima et al. (US 6,468,665).

Respect to claim 16, Nakagawa and Clarke fail to disclose the component comprises a roughened surface that has been subjected to surface roughening treatment and it is in contact with the plasma sprayed coating applied on the roughened surface. However, Nakagawa and Clarke teach the component comprises plasma

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sprayed coating liquid crystal polymer. In a liquid crystal polymer component, Nagashima teaches to perform a roughening treatment process on surface (col. 11 lines 34-50). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Nakagawa and Clarke by having a roughened surface because this will enhance the deposition process.

10. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakagawa in view of McCullough (US 6,048,919).

Respect to claim 17, Nakagawa fails to disclose the liquid crystalline polymer contains filler. McCullough discloses that the liquid crystalline polymer contains filler resulting in performance superior. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Nakagawa in view McCullough by using filler in liquid crystalline polymers because it reduces the number of transitions surfaces.

11a. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakagawa in view of Nagashima.

11b. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakagawa and Clarke as applied to claim 13 above, and further in view of Nagashima et al. (US 6,468,665).

Respect to claims 26 and 30, Nakagawa fail to disclose at least one intermediate layer between the surface of the substrate and the coating. Nagashima teaches at least one intermediate layer between the substrate's surface and the coating (col. 11 lines 35-50). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Nakagawa or Nakagawa/Clarke in view of Nagashima by having at

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least one intermediate layer because this layer will protect the substrate and create a multiplayer component.

12<sub>a</sub>. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakagawa in view of Han et al. (US 6,508,911).

12<sub>b</sub>. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakagawa and Clarke as applied to claim 13 above, and further in view of Han et al. (US 6,508,911).

Respect to claims 28 and 32, Nakagawa fail to disclose the substrate is a ceramic material selected from the group consisting of silicon carbide, silicon nitride, boron carbide and boron nitride. However, Nakagawa clearly discloses the substrate is aluminum. In a semiconductor processing equipment, Han discloses the chamber surface (i.e. the substrate of the coated component) is made of aluminum and boron carbide. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Nakagawa or Nakagawa/Clarke in view of Han by using boron carbide because this material has proven to be extremely durable against plasma etchant.

***Allowable Subject Matter***

13. Claim 25 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 1st paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.



14. Claim 29 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter: The cited prior arts fail to disclose or suggest the surface of the component is a bead or grit-blasted roughened surface which is mechanically keyed or interlocked with the coating in conjunction with all other limitations in the claim.

### ***Response to Arguments***

16. Applicant's arguments filed 6-22-2004 with respect to claims 8-18 have been fully considered but they are not persuasive.

The applicants argue that Nakagawa discloses, "It is critical that the resin molded articles be a seamless annular molded articles". According to applicants, Nakagawa does not disclose or suggest the component is "a chamber liner made entirely of liquid crystalline polymer and/or a component other than a chamber liner". The examiner disagrees. The examiner acknowledges that Nakagawa teaches the article is resin. However, Nakagawa clearly discloses the resin material is liquid crystal polymer (page 5 lines 23-24 or page 6 lines 5-6).

Respect to claim 15, the applicants cites that The American Heritage Dictionary define the term "sheet" as "a broad, thin, usu. rectangular mass or piece of material, such as paper, metal, glass, or plywood". According to applicants, Nakagawa discloses the resin molded articles be a seamless annular, which is different from a sheet. The examiner disagrees. The examiner interprets that the term "sheet" means "a broad, thin

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piece of material". The definition in the dictionary does not require that a sheet must have a rectangular shape. Base on this definition, the examiner still maintains that Nakagawa discloses a broad, thin piece or a sheet of liquid crystal polymer.

The applicants further argue that Clarke and McCullough are non-analogous art because they are not pertinent to the problem to which component is directly to, namely "providing plasma resistant and corrosion resistance surface on components of plasma processing equipment to reduce particle and metallic contamination of semiconductor wafers processed equipment". This argument is not commensurate with the scope of the claim. There is no limitation in the claim that requires that the articles must provide "plasma resistant and...reduce particle and metallic contamination of semiconductor wafers". The examiner still maintains Clarke is analogous art because Clarke teaches the advantage of using plasma sprayed liquid crystal polymer. The examiner still maintains that McCullough is analogous art because it teaches the advantage to have filler in liquid crystal polymer.

17. A new grounds of rejection was set forth to address applicants' new claims 24-32.

### ***Conclusion***

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X Tran whose telephone number is (571) 272-1469. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free)

Binh X. Tran

NADINE G. NORTON  
SUPERVISORY PATENT EXAMINER

